

15¢

SCIENCE DEPARTMENT

MAY 14, 1949

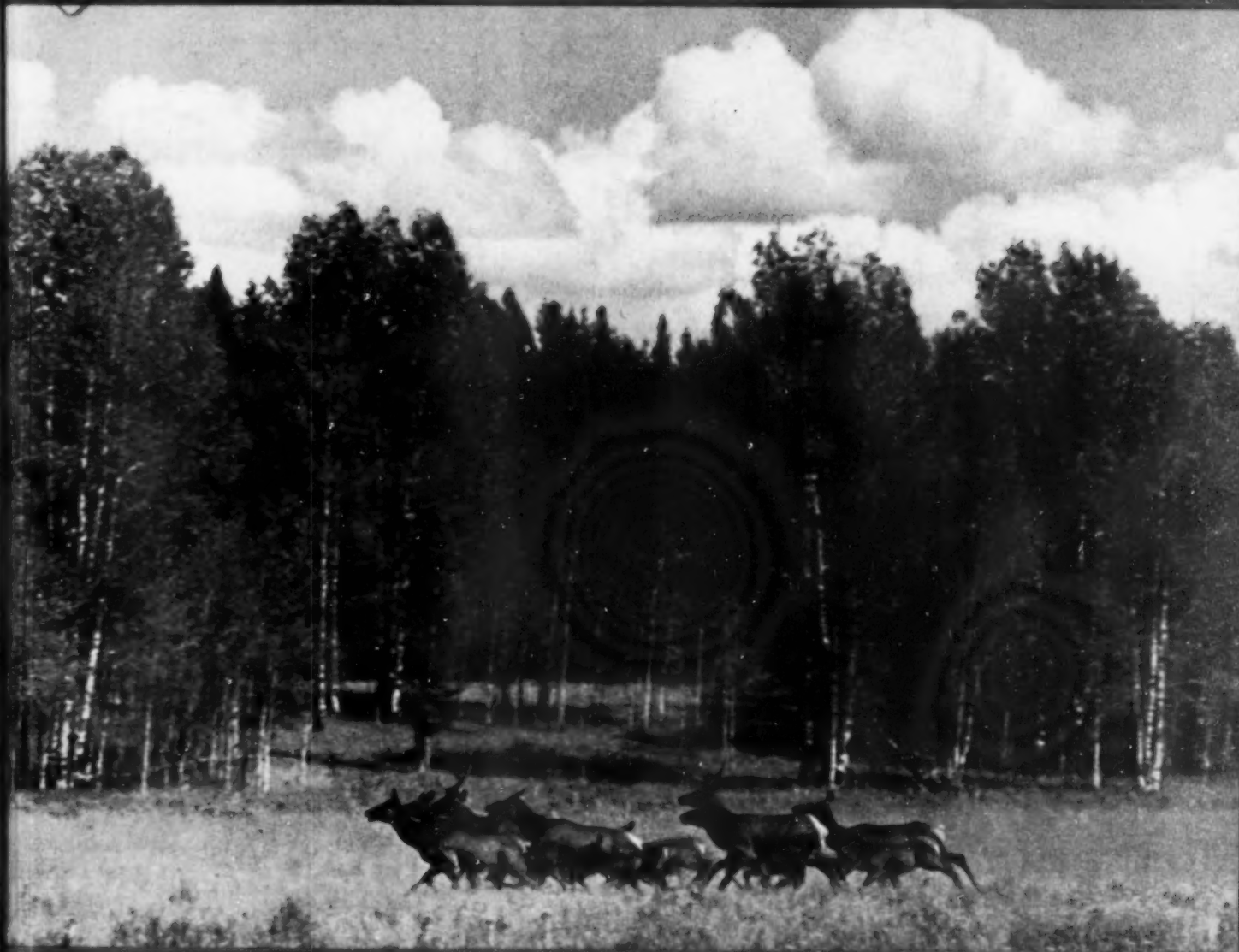
SCIENCE NEWS LETTER

PUBLIC LIBRARY

MAY 17 1949

DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE



At Large, But in Sight

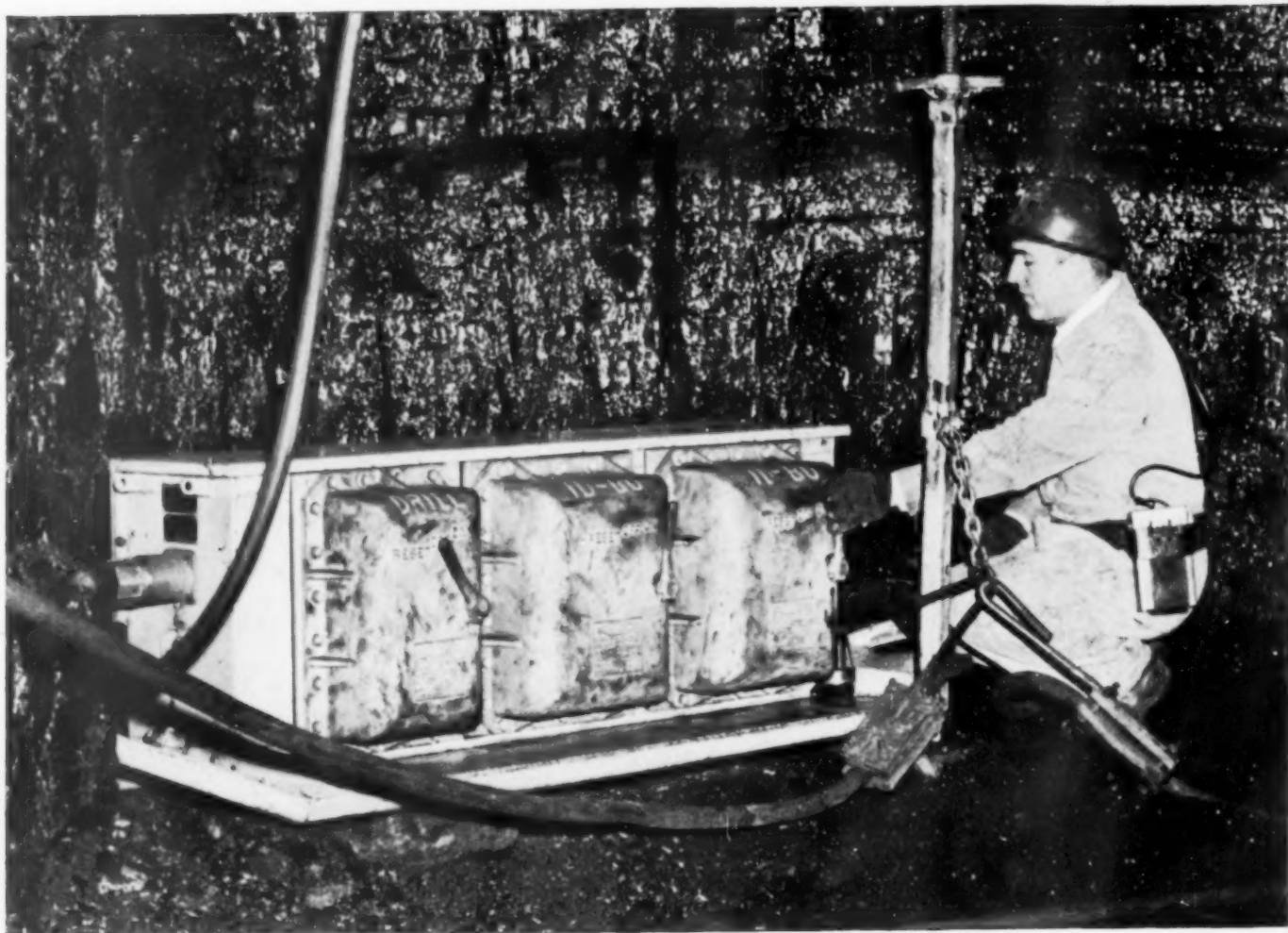
See page 311

A SCIENCE SERVICE PUBLICATION

\$5.50 A YEAR

VOL. 55 PAGES 305-320

YOU CAN BE SURE..IF IT'S Westinghouse



“WATCHDOG” *for wayward current*

Mine explosions caused by short-circuit faults have been given a decided setback by this new electrical guardian recently developed by the Mines Equipment Company in conjunction with Westinghouse.

Now, lines carrying electrical power must pass through the “watchdog”—which consists of Westinghouse AB “De-ion” circuit breakers—before feeding to individual mining machinery. Then . . . if electricity fails at one of the cutters,

drills or loaders . . . or if cables or machine installations break down and become dangerous . . . this dependable “watchdog” notes the change in current and the AB breakers automatically trip to shut off the power.

Helping to prevent mine disasters with equipment like this is only one example of how Westinghouse engineers work constantly to solve the problems of industry in a practical manner . . . through the aid of research.

G-10023



Westinghouse
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

ASTRONOMY

Magnetic Iron in Space?

Needle-shaped minute bits of iron in giant magnetic fields may occupy outer space between stars, two Princeton astronomers suggest.

► SPACE outside the earth's atmosphere may be filled with tiny, magnetic needles of iron in giant magnetic fields.

This newest picture of what lies between the stars was suggested by two Princeton University astronomers in the journal, *SCIENCE* (May 6).

These needle-shaped bits of intensely magnetic iron which may occupy vast reaches of space would be so tiny they would be invisible to the naked eye, even from close range (perhaps through the windows of a future space ship). But clues hinting that these minute needles are out there have been discovered, Drs. Lyman Spitzer, Jr., and John W. Tukey said.

Their idea, which they are not ready to term a "theory" yet, came from the findings of American and Dutch astronomers and a new theory of one of the world's leading atomic scientists.

Dr. W. Arthur Hiltner, of Yerkes and MacDonald Observatories of the Universities of Chicago and Texas, and Dr. John S. Hall, of the U. S. Naval Observatory in Washington, reported earlier this year that light from the stars of the Milky Way

dances in a restricted way. Milky Way starlight, they found, vibrates more in one direction than another. It is polarized light.

The Princeton astronomers say that magnetic iron needles in space might account for this, if there are giant magnetic fields. These fields, they add, would be on the order of those suggested recently by Dr. Enrico Fermi of the University of Chicago. Dr. Fermi, an inventor of the chain-reacting pile which led to the atomic bomb, believes these fields are involved in the birth of the cosmic rays which bombard our earth.

The theory of two Dutch astronomers, Prof. Jan Hendrik Oort and Dr. H. C. van de Hulst, helps explain the growth of particles in interstellar space. Drs. Spitzer and Tukey propose that the particles may be compounds of iron, magnesium and oxygen.

If more research confirms the Princeton astronomers' idea of space, they believe that it may be possible to chart the magnetic fields between the stars.

Science News Letter, May 14, 1949

MEDICINE

Advances in TB-Fighting

► STREPTOMYCIN'S effectiveness in TB-fighting has been prolonged by combining it with para-aminosalicylic acid, PAS for short, the National Tuberculosis Association was told in Detroit. This was one of three drugs on trial to overcome the limitations of the antibiotic.

Studies with the sputum of TB patients revealed that the disease germs remained sensitive to the antibiotic up to the 120th day of treatment when PAS was added, William Steenken, Jr., head of the laboratory of Trudeau Sanatorium, Trudeau, N. Y., reported. With streptomycin treatment alone, resistant germs began to emerge about the 42nd day of treatment, he pointed out.

Promizole, a distant relative of the sulfa drugs, was also tried in combination with streptomycin but failed to retard the growth of resistance in the tubercle bacilli to the antibiotic, Mr. Steenken stated.

Confirmation of these results was presented by Dr. William B. Tucker, chief of the tuberculosis service of the Minneapolis Veterans Administration Hospital. Dr. Tucker pointed out that evidence has been accumulated which shows that PAS in combination with streptomycin delays TB

germs from becoming sensitive to the antibiotic. Promin, a relative of the sulfa drug family, and promizole had no delaying effect.

Streptomycin treatment of approximately 6,000 patients with various forms of TB in the VA program has also demonstrated that by cutting the dosage of the drug and administering it at three-, four- or five-day intervals, its effectiveness could be prolonged without reducing the benefits of the treatment, Dr. Tucker stated.

A derivative of streptomycin, dihydrostreptomycin, has shown promise in overcoming another handicap of the antibiotic in which patients suffer a disturbance of equilibrium, Dr. N. Stanley Lincoln, director of the Hermann M. Biggs Memorial Hospital, Ithaca, N. Y., told the meeting.

Studies in progress at four New York state tuberculosis hospitals, the Hermann Biggs, Homer Folks, Mt. Morris, and Ray Brook, have revealed that this derivative drug is less toxic to the nerve tissue than the parent drug, Dr. Lincoln and associates reported. However, dihydrostreptomycin leaves the problem of resistant germs unsolved.

Streptomycin is not equally effective against all forms of TB. It is of greatest benefit in miliary TB which spreads rapidly throughout the body and in TB of the skin and mucous membrane, the lining tissues of body organs, Col. Hugh Mahon, chief of the pathology service of Fitzsimons General Hospital, Denver, declared.

It is less effective, he pointed out, in pulmonary TB because the antibiotic has only an indirect effect on lung cavities, not being able to penetrate the fibrous tissue of the wall of the cavity.

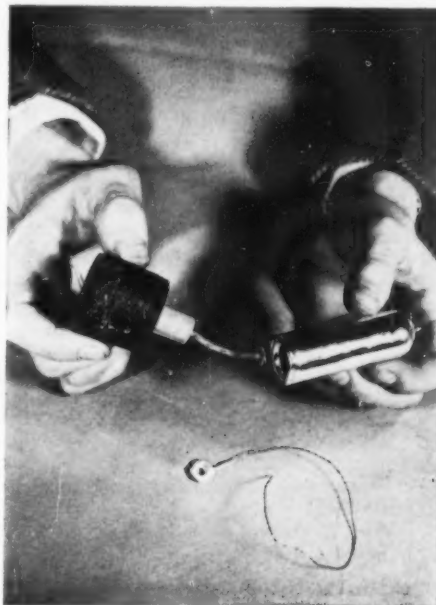
Science News Letter, May 14, 1949

ENGINEERING

Thirty Miles Up Measured By New Air-Borne Device

► DISTANCES above the earth up to 30 miles can be measured with high accuracy by a new instrument, revealed by General Electric engineers. It is a new type of hypsometer, an instrument that measures altitudes by determining the boiling point of a liquid and from it calculating the atmospheric pressure.

The fact that the boiling point of water decreases as the atmospheric pressure decreases is well known. It is also well known that the atmospheric pressure depends largely upon the altitude. This new hypsometer was developed particularly for use in free balloons which are sent high above



ALTITUDE MEASURED—Carried aloft in balloons, this instrument gives data on altitude by boiling a small quantity of water in the glass vacuum bottle and then measures the water's temperature electrically. The doughnut in the foreground is the heating coil with a tiny battery connected to its wire tail.

the earth, reporting automatically by radio the weather conditions encountered. It looks like a radio tube, and was designed to replace the presently used bellows-type devices which expand and contract with changes in the air pressure.

The instrument contains a small vacuum flask which holds about five thimbles-full of liquid. Water sometimes is used, but a liquid with a lower freezing point, such as carbon disulfide, is usually chosen. Inserted in the open end of the liquid chamber is a thermistor, a delicate device for measuring temperature. It is a device in which the electrical resistance changes as the temperature changes.

The steam from the boiling liquid causes the temperature changes. It is the changes in the electrical resistance of the thermistor that are transmitted to the ground station by the balloon's radio. The greater accuracy of this instrument is due to the fact that it is the temperature of the steam itself that is used as an index, not that of the boiling water.

Science News Letter, May 14, 1949

Science Service Radio

► LISTEN in to a discussion on "Progress in Detecting Cancer" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EDT, May 21. Dr. Charles Huggins, professor of surgery at the University of Chicago, will be the guest of Watson Davis, director of Science Service. Dr. Huggins recently announced a blood test for the detection of cancer which is expected to come into general use in the coming months, and it should be a very real life saver for the future. Dr. Huggins will tell in his own words about this progress and related research.

Science News Letter, May 14, 1949

Words in Science— ENDEMIC

► WHEN a disease is prevalent among a limited population or community, it is said by public health officers to be endemic, en-dem-ic with the stress on dem. Malaria, for example, is endemic in certain parts of the world.

When the disease spreads so as to affect an unusual proportion of the population or so that it is not limited to a single locality, then it is said to be epidemic, pronounced e-pi-dem-ic.

If the disease should spread to international or world-wide proportions, it is said to be pandemic. Influenza was pandemic in 1918.

The origins of these words make clear their meaning. The latter part, "demic" comes from the Greek word for people, the same one from which we get the word democracy. The prefix "en" means within and indicates its confinement to a locality; "pan" means all, pointing out its widespread nature; "epi" means on or over, indicating that it is spread over the community or population.

Science News Letter, May 14, 1949

CHEMISTRY

Pioneer Sugar Chemist's Son Wins \$5,000 Prize

► THE SON of a pioneer scientist in the field of sugar chemistry was awarded the \$5,000 fourth annual sugar research prize.

Dr. Hermann O. L. Fischer of the University of California was presented the award by the National Science Fund of the National Academy of Sciences. Dr. Fischer's father was the German chemist, Emil Fischer, who has been called the "father of modern carbohydrate chemistry."

The University of California chemist and

the three previous winners of the award are eligible for a final grand prize of \$25,000 to be awarded next year for the most outstanding contribution to original knowledge about sugar since 1945.

After leaving Germany in 1932, Dr. Fischer served as a professor of chemistry in Switzerland and Canada before going to the University of California last fall.

Dr. Fischer's research was hailed as "vital not only to progress in organic chemistry, biochemistry and physiology, but basic to better understanding of nutritional problems," by Dr. Hans Clarke of Columbia University in a presentation address.

Science News Letter, May 14, 1949

SCIENCE NEWS LETTER

VOL. 33

MAY 14, 1949

No. 20

50,800 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change, please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1949, by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avoid themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. State 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, Princeton University; Karl Lark-Horowitz, Purdue University; Kirtley F. Mather, Harvard University. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; R. A. Millikan, California Institute of Technology; L. A. Maynard, Cornell University. Nominated by the National Research Council: Ross G. Harrison, Yale University; Alexander Wetmore, Secretary, Smithsonian Institution; Rene J. Dubos, Rockefeller Institute for Medical Research. Nominated by the Journalistic Profession: A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Baltimore Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. Nominated by the E. W. Scripps Estate: H. L. Smithson, E. W. Scripps Trust; Frank R. Ford, Evansville Press; Charles E. Scripps, Scripps Howard Newspapers.

Officers—President: Harlow Shapley, Vice President and chairman of Executive Committee: Alexander Wetmore, Treasurer: O. W. Riegel, Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Frank Thane, Jane Stafford, A. C. Monahan, Marjorie Van de Water, Martha G. Morrow, Ron Ross, Lydia Schweiger. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. In London: J. G. Feinberg.

Question Box

ASTRONOMY

What is believed to lie between the stars in space? p. 307.

CHEMISTRY

What new kind of chemical element has been discovered? p. 313.

ENGINEERING

How does a new instrument measure altitude? p. 307.

What method is being used to study home plumbing systems? p. 309.

GENETICS

The fur of what animal has the appearance of ermine? p. 313.

MEDICINE

How can cancer be detected electrically? p. 309.

What is the new factor found in blood? p. 310.

What seems to be the world's first molecular disease? p. 312.

Photographs: Cover, New York Zoological Society; p. 307, General Electric Company; p. 309, Yale University; p. 311, Harvard University; p. 314, American Red Cross and Massachusetts Memorial Hospitals.

ENGINEERING

Plastics Reveal Plumbing

Transparent pipes are being used in experiments to study the home plumbing system. They are expected to aid in making out future plumbing codes.

► CLEAR plastic pipes which you can look right into will not go into the plumbing of your "dreamhouse," but the National Bureau of Standards said that they may help overcome one serious housing problem and aid in untangling some jumbled and costly plumbing laws.

The transparent pipes are being used in full-scale home plumbing systems set up at the Bureau in Washington. By peering into the pipes and even taking motion pictures, Bureau scientists hope to be able to tell city code writers what they should permit and what they should ban in plumbing codes.

"The thousands of conflicting plumbing codes existing in the United States today not only cost the public millions of dollars annually, but are also seriously hindering the nation's housing program," a Bureau statement charged.

These codes in some 1,500 cities are so different that manufacturers cannot standardize many plumbing products. What meets one code may not meet another. Because of this legal conflict, the Bureau is making its study in cooperation with the Uniform Plumbing Code Committee at the

request of the Housing and Home Finance Agency.

Using the plastic pipes, Bureau scientists have studied the operation of traps, the curved sections of drainage pipes under lavatories or bathtubs, and different venting systems for home plumbing systems.

Traps use water to seal the pipe and prevent back-tracking of gas and sewer odors, but the seal may be broken by what is called self-siphonage. Vent pipes are installed to reduce the suction from fixture drains. How close to the trap these vents

must be is a critical home plumbing problem. Different city codes permit anything from two to eight feet.

Experiments with the laboratory plumbing showed that the shape and size of the stopper outlet in your sink or tub are important in holding the seal. Small changes in the size and shape, it was pointed out, may cause a big change in the rate of discharge.

It also was found that short-turn drainage fittings are better than long-turn fittings and that large internal diameters are needed in traps.

Stack-venting and wet-venting were approved by the scientists. In stack-venting, the drains of several fixtures use one vent, at a saving in plumbing cost. Wet-venting systems use the drain of one fixture as vent of another. This economical arrangement has been forbidden by some municipal plumbing codes, but the studies showed that it is practical with only simple restrictions.

Science News Letter, May 14, 1949

MEDICINE

Find Cancer Electrically

► AN electrical detection method may become a mass cancer screening tool of the future. The method is relatively simple, takes about 25 minutes for each test, and has an accuracy rating of about 85%.

It was devised by Dr. Harold S. Burr, professor of anatomy at Yale University, and Dr. Louis Langman of the depart-

ment of obstetrics and gynecology at New York University College of Medicine.

So far, it has been used only with women patients to detect cancer of the female genital tract. Drs. Burr and Langman feel, however, that the principle applies to all forms of cancer and they are now planning the necessary research for applying the test to other kinds of cancer.

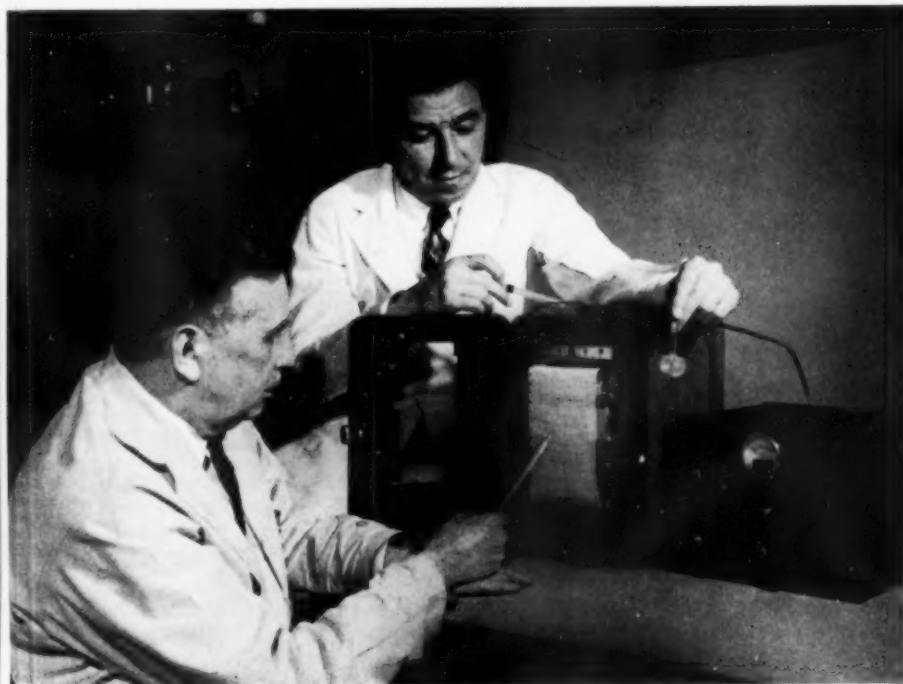
The test has been given during the past two years to several hundred women at Bellevue Hospital. Cancer was detected in 74 of 75 women diagnosed by other procedures as definitely having cancer. Of 616 women diagnosed as no cancer by the electrical detection method, other methods proved definitely that 611 did not have cancer.

Certain conditions other than cancer, such as pregnancy, may give the same reading on the test as cancer does.

"These tests," the two doctors state, "suggest that the new technique offers an excellent method for screening suspected cases of malignancy (cancer)."

The test is based on: 1. the fact that living systems, such as the human body, possess electrical activity; 2. the idea that electrical manifestations, such as those from the heart which give electro-cardiograms for diagnosis, are evidence of an electrodynamic field in all living beings; and 3. the theory that this field, through its inherent forces, imposes design on all living matter.

Since the design has gone awry in cancer, Dr. Burr reasoned that there must be a detectable electrical difference between cancer tissue and normal tissue. To test the theory, it was necessary to design special electrical equipment. Cecil T. Lane, associate professor of physics at Yale, helped the



CANCER DETECTION—Examining their specially-designed electrical apparatus for detecting certain kinds of cancer are Dr. Harold S. Burr (left) of Yale University and Dr. Louis Langman of New York University.

medical men with this problem by working out equipment using a microvoltmeter. Connected on one side are the electrodes

which are attached to the patient's abdomen and on the other side is the photoelectric recorder.

Science News Letter, May 14, 1949

MEDICINE

Find New Factor in Blood

➤ A NEW factor has been found in human blood. You have it. Practically everybody has it. It is so universally present that when the blood of 2,500 women was examined only 5 (0.2 per cent) were found to lack it. It is reported in the journal *SCIENCE* (May 6), by Drs. Philip Levine, May Backer, Milton Wigod, and Ruth Ponder, of the Blood Testing Laboratory, Ortho Research Foundation, Raritan, N. J., and the Nassau Hospital Laboratory in Mineola, N. Y.

Discovery of this new blood factor was due, however, to the fact that one woman

did lack it and because of that her blood was incompatible with that of her infant, resulting in illness in the baby. The new factor which 99.8% of the population has is named for this one woman who did not have it. It is called by its discoverers the Cellano factor.

A list of Cellano negative blood is being prepared. Such blood would be essential for use in transfusions of those rare persons whose blood is incompatible with Cellano positive blood and also for their babies who may be ill as a result of having Cellano negative mothers.

Science News Letter, May 14, 1949

MEDICINE

Remedies for Fungus Ills

➤ REMEDIES which speed up the cure of common fungus infections of the skin, hair and nails were reported to the meeting of the Medical Society of the State of New York in Buffalo, by Dr. Frederick Reiss of New York.

Accepted fungus-killing agents were combined with a skin-penetrating chemical which resulted in more rapid cures than was possible with other fungicidal remedies. Dr. Reiss' "new vehicle" was particularly effective in stepping-up the cure of ringworm of the nails in which they become white, thickened, soft and brittle.

Ringworm of the scalp responded dramatically to another remedy, podophyllin, which comes from American mandrake or

May-apple root. This is an old Indian remedy which some years ago went on trial as an anti-cancer drug.

Results with podophyllin were remarkable. A cure was obtained in one patient in a week, Dr. Reiss reported. Others began to improve in three or four days, the Wood light test showed.

Trial of a compound containing nitrogen, zinc and sulfur was successful in most treatments of the parasitically-produced skin diseases. Dr. Reiss found it was especially valuable in the cure of a condition which is characterized by scaling, patches on the shoulders, chest, upper back and upper abdomen.

Science News Letter, May 14, 1949

NUTRITION

Spinach Not Most Disliked

➤ ALTHOUGH much-joked about spinach is high on the list of foods pushed aside and not eaten by college freshmen, it is better liked than broccoli and asparagus.

The latter two vegetables were eliminated from the diet, either because of dislike or allergy, 35 times by the 595 freshmen whose eating habits were studied by Drs. Clara B. Young and Clara A. Storvick, of the School of Home Economics, Oregon State College. Liver was eliminated 77 times and heads the list of disliked foods.

The college boy eats more nourishing meals than does the co-ed. He eats better if he eats in a boarding house than if he gets his meals in a private home. The

contrary is true of girls; they eat better in a home.

The college freshman, in general, is well fed. Nearly two-thirds of the students eat a fair diet, 19% have good diet and only 17% have poor diet.

The popular picture of the college freshman as living on candy bars and cokes was exploded by this survey. Average intake of sweets was found to be the equivalent of two candy bars a week, the range being from none to as many as 28 bars weekly. Average consumption of carbonated beverages was approximately three glasses weekly; some drank none while the most was 21 glasses a week or three a day.

Breakfast is neglected by some students. Although 76% eat breakfast every day, 15% ate breakfast only one to six times a week and 9% did not bother with breakfast at all.

In general, the student who does not eat breakfast has a poorer diet than those who eat this morning meal. Of the 452 who start the day with breakfast, 22% have a good diet and only 14% a poor diet, the rest being in the "fair" pigeonhole. Of those who eliminate breakfast, 43% eat a poor diet and only 4% a good diet.

Details of the food-habits survey of college freshmen are reported in the *JOURNAL OF THE AMERICAN DIETETIC ASSOCIATION* (April).

Science News Letter, May 14, 1949

BIOLOGY

Explode Theory That There Are Less Live Male Births

➤ THE widely-held idea that boy babies are less likely to survive the pre-birth period and be born alive was exploded by study of the 5,787 fetuses in the collection of the Carnegie Institution of Washington, the result of miscarriages in the third to the seventh month of pregnancy.

There is no tendency for a higher proportion of males among the younger fetuses, reports Dr. Christopher Tietze, in *HUMAN BIOLOGY* (Sept. 1948). He found no evidence that the sex ratio at the beginning of pregnancy is materially different from the approximately 106 boys to 100 girls who survive to a safe birth.

"Hypotheses based upon a heavy excess mortality of males during the previable period would seem to be in need of revision," Dr. Tietze concludes.

Science News Letter, May 14, 1949

ACOUSTICS

You Speak More Slowly in Large than in Small Room

➤ YOU SPEAK more slowly in a large room than in a small one and you raise your voice so that you speak louder in a small room with less reverberation.

This was shown when 23 men read 12 test phrases into a microphone connected with a meter that registered the intensity of the voice and the length of time of reading. The experiment was conducted in eight rooms of differing size, shape and reverberation time.

Shape of the room did not affect either the speed of reading or the voice intensity. But both the size of the room and the reverberation, due to the sound treatment of the rooms, were important.

Results of the experiment were reported to the meeting of the Acoustical Society of America in New York by Dr. John W. Black, of Kenyon College, Gambier, Ohio.

Science News Letter, May 14, 1949

PSYCHOLOGY

Record People's Actions

A psychological shorthand machine has been invented enabling the operator to record how people get along together in small groups.

➤ **INVENTION** of a kind of psychological shorthand machine which will make it possible to study just what goes on in small groups such as committee meetings or family councils around the dinner table, was announced by its inventor, Dr. Robert F. Bales, of the Laboratory of Social Relations at Harvard.

In the study of how people get along together in small groups, it is important to be able to make a record of what each one does—when one bawls another one out, when he asks for another person's opinion or consults the whole group, when he tries to break up an argument or offers a compromise, when he makes an irrelevant remark, when he gets mad and pounds the table, or when he just sits silent and loses interest in what is going on.

Dr. Bales has found that all the possible actions of a person in a small group meeting can be classified under 14 headings. On his machine 14 numbers appear in a row. Beneath them a wide roll of white paper moves slowly. As each person says or does something, the observer makes a note below the appropriate number.

If Man 1 says to Man 2, "You've done

a poor job on this," the observer scores 1-2 (Man 1 to Man 2) under the number 14 which means "deflates other's status." If Man 3 starts out, "I wonder what you people think about this . . ." the observer will score 3-0 (0 stands for whole group) under the number 9 which means "asks for opinion."

To avoid interfering with the naturalness of the meeting, the observer and the machine are placed on the other side of a one-way-view window which looks like a plain mirror to those in the conference room. Thus the observer can see and hear everything that goes on without himself being observed. Dr. Bales calls his new research instrument an "interaction recorder."

Science News Letter, May 14, 1949

ICHTHYOLOGY

Fish Shower Phenomenon Seen by Ichthyologist

➤ **FISH** falling from the sky, a much-disputed phenomenon, have finally been observed by a witness whose word must be

respected even by skeptical scientists, for he is a professional ichthyologist, or researcher into the facts of fish life. Dr. A. D. Bajkov, of the Oyster Laboratory in Biloxi, Miss., reports the "fish rain" in the journal, *Science* (April 22).

He states that he was having breakfast with his wife in the town of Marksville, La., when the waitress informed him that fish were falling from the sky. The couple immediately went out to investigate, and found that there had been a really heavy fall of small fish, from two to nine inches in length, not only in streets and yards but on the roofs of houses. The zone covered by the fish shower was 1,000 feet long by 75 to 80 feet wide.

Recalling a report of a shower of frozen fish in Essen, Germany, in 1896, Dr. Bajkov felt some of the specimens. He found them cold, but not frozen.

Most numerous, among the species represented, was the hickory shad. Other species were large-mouth black bass, goggle-eye, two kinds of sunfish and several kinds of minnows. All were in fresh condition.

There was no report of any tornado in the vicinity at the time, but Dr. Bajkov recalls having seen on the previous day a number of smaller whirlwinds or dust-devils. One of these, passing over a well-stocked pond, may have picked up the fish and later dropped them as it whirled over the town higher in the air.

Science News Letter, May 14, 1949

ZOOLOGY

Herds Roam Free Yet Stay in Sight

See Front Cover

➤ **NATIVE** big-game animals can be seen at the nearest big-city zoo, but they are so obviously penned that the illusion of wildness is shattered. In most of our National Parks and many of our National Forests, such animals exist in abundance, but in those practically limitless spaces they don't always oblige by remaining in sight.

A happy medium has been provided in the new Jackson Hole Wildlife Park, a 1,500-acre tract of wilderness just south of Yellowstone National Park in Wyoming. Good roads make it readily accessible to tourists, and cleverly camouflaged barriers around a 400-acre sector keep a herd of bison and one of American elk or wapiti where people can be sure of a look at them. A glimpse of what they may see is shown on this week's cover of the *SCIENCE NEWS LETTER*.

Other animals in the new park include moose, mule deer, white-tailed deer and pronghorn antelope.

Besides being a tourist attraction, the Jackson Hole Wildlife Park affords research opportunities for zoologists and their students. Parties from 14 colleges and universities studied there last summer.

Science News Letter, May 14, 1949



GROUP INTERACTION RECORDED—Dr. Robert F. Bales of Harvard University sits behind a one-way window and records people's reactions to each other by his unique method which involves the use of a kind of psychological shorthand machine.

BACTERIOLOGY

"De-Tailed" Bacteria Still Able To Swim

► THE "tails" with which some species of bacteria are equipped are not needed for swimming, declares Dr. Adrianus Pijper of the University of Pretoria, South Africa, in the journal, *SCIENCE* (April 15). He has been contending for some time that such bacteria swim by twisting and wriggling their way through surrounding fluid, and that their tails, or flagella, are merely something trailing behind them.

Now, however, he has gone a step beyond. He grew a lot of "tailed" bacteria in suitable broth, and deprived them of their tails by shaking them hard for 15 minutes. At the end of that time, microscopic examination showed that most of their tails had been amputated; yet the bacteria were swimming about, and lively as ever.

Science News Letter, May 14, 1949

PHYSICS

Long "Rope" of Water Would Support Own Weight

► A VERY fine "rope" of water hanging down one and four-tenths miles would support its own weight and not break.

Dr. Lyman J. Briggs, ex-director of the National Bureau of Standards, reported to the National Academy of Sciences in Washington, experiments that promise to help explain how the tallest trees are able to suck up sap from their roots. Water is as strong in tension as some metals, provided it is in a small enough tube.

As every schoolboy is taught and as well-diggers learn from experience a common suction pump won't raise water more than about 32 feet.

Dr. Briggs doesn't deny this, but the little capillary tubes that he whirled at high speeds until the water in them broke in two developed a negative pressure of about 223 atmospheres, which is equivalent to a vertical column of water 7,400 feet high hanging from the closed top of the tube which contains it.

Science News Letter, May 14, 1949

PSYCHOLOGY

Dull Student Differs in Taste from Bright Student

► THE boy whose low grades keep him out of the college preparatory courses in high school differs from the brighter boys in what he admires in his classmates.

The dull boy whose poor marks land him in the so-called "general course" likes his classmate to be a good listener rather than talkative or just silent. He admires a boy who is neat in appearance rather than one who could be called a "good dresser." He prefers fellows who are athletic to those

talented in arts or crafts. He has a greater liking than does the bright boy for classmates who enjoy practical jokes as compared with the serious-minded.

These differences in taste may reflect more than difference in intelligence or school grades. The two groups of high school students whose preferences in companions were surveyed in a suburb of New York were alike in proportion of each sex, age and grade in school, but they came from entirely different kinds of homes.

There was almost no overlapping of the two groups in regard to the occupation of their parents. All those in the college preparatory course have parents in professional, managerial, clerical or business occupations. Nearly all those in the general course are from laboring or semi-skilled worker groups.

Sex differences were few, but girls have a greater preference for others of their own sex who cooperate with a group as compared with those who enjoy their own hobbies or are good leaders. They also have a greater admiration than do the boys for those who enjoy hearing or telling jokes as opposed to those who enjoy practical jokes, and for the serious-minded as against the practical jokers.

The study was reported to the *JOURNAL OF SOCIAL PSYCHOLOGY* by Drs. Anne Anastasi and Shirley Miller, of Fordham University and Barnard College, Columbia University.

Science News Letter, May 14, 1949

ENGINEERING

Fiber Glass Boats Buoyed By Tiny Glass Bubbles

► FAMILY boats, with one-piece hulls made of impregnated glass fiber, utilize tiny glass bubbles for increased buoyancy, the Beetle Boat Company of New Bedford, Mass., revealed. The bubbles are in a product known as Foamglas which is placed in various parts of the hull.

Foamglas is a product of the Pittsburgh Corning Corporation. It does not absorb moisture, since the cells in it are closed. The boat is leak-proof, corrosion-proof, rot-proof and is not attacked by vermin. Its light weight is one of its principal features. The 12-foot boat, with a six-foot beam and nine-inch draft, weighs only about 300 pounds.

The type to be available this summer is a sailboat, with a sail area of about 90 square feet. Foamglas has been widely used by the U. S. Navy and U. S. Merchant Marine in life rafts, floats and other buoyant equipment. One-piece boats of fiber glass impregnated with a resin are already under test by the Army Engineers. The same material has been used experimentally in wings for airplanes. The advantage of the impregnated glass fiber material is a combination of high strength, durability, resistance to destructive agencies and light weight.

Science News Letter, May 14, 1949

IN SCIENCE

MEDICINE

World's First Molecular Disease Is Discovered

► DISEASE has been traced to a difference in the composition of a chemical molecule of the blood and the charge of electricity upon it.

Dr. Linus Pauling, heading a chemical group from the California Institute of Technology, reported to the National Academy of Sciences his discovery that sickle cell anemia seems to be the world's first molecular disease. This disorder has red blood cells that have the shape of a sickle, and this is caused by the difference in the two kinds of hemoglobin molecules.

Science News Letter, May 14, 1949

METEOROLOGY

Radar Used in Obtaining Picture of Thunderstorms

► RADAR'S penetrating glances were turned on the thick clouds of thunderstorms by Dr. E. J. Workman of the New Mexico School of Mines, who reported his results in Washington at a joint session of the American Meteorological Society and the American Geophysical Union.

Here are some of the things radar helped to show him:

A thunderstorm develops "straight up and down", or nearly so. A strong horizontal wind aloft will knock its top off and prevent it from developing.

The cloud is deep, with temperatures at the bottom near freezing and internal temperatures at higher levels dropping all the way from 25 or 30 below zero Fahrenheit to as much as 70 below. The top of the cloud must always be cold enough to produce quick freezing of water.

When the cloud top, as seen by radar, gets to a temperature of about 50 degrees below zero Fahrenheit, it begins to collapse downward. The collapse is rapid—as much as 800 feet per minute. Rain comes out of the base at temperatures between 45 and 50 degrees above zero.

Lightning flashes begin when the cloud reaches its maximum height, the first stroke usually coming about when the rain begins to fall. Strokes may jump from point to point within the cloud; when they jump between cloud and earth they are apt to follow the path of the rain. Field observations and laboratory tests agree in indicating that much of the electricity in the lightning is accumulated in connection with the formation of ice, in the form of hail.

Science News Letter, May 14, 1949

NEW FIELDS

CHEMISTRY

Scientists Discover New Kind of Nitrogen

► DISCOVERY of a new kind of nitrogen, one of the commonest of the chemical elements, was announced in Washington to the American Physical Society by Dr. Luis W. Alvarez of the University of California's Radiation Laboratory.

It is mass 12 contrasted with mass 14 nitrogen which exists in greatest abundance in the air we breathe. The new isotope is manufactured by bombarding carbon with high energy protons from an atom-smashing linear accelerator. The new nitrogen 12 lives only a fleeting instant, a mere dozen thousands of a second of half-life, before disintegrating through its radioactivity.

Nitrogen of 13, 14, 15, 16 and 17 mass had been previously known.

Discovery of three other new isotopes, all radioactive and made by bombardment, were announced by scientists from the Ohio State University. These are zirconium 87, yttrium 85, and molybdenum 91. These disappear after a few minutes or hours. The physicists reporting these discoveries were Drs. M. L. Pool, W. E. Scott, B. E. Robertson and D. N. Kundu.

Science News Letter, May 14, 1949

GENETICS

White Muskrat Discovered Has Luxury Look of Ermine

► WHITE fur coats with the luxury appeal of ermine but the pocketbook appeal of muskrat may be what the fashionable woman will wear some years in the future. They will come from the backs of a new kind of muskrat found in the swampy lands around Cambridge, Md.

The new muskrats have been named Maryland white by Dr. Herbert L. Dozier, director of the U. S. Fur Animal Field Station there. They are not true albinos but a new mutation, he reports to the JOURNAL OF MAMMALOGY (Nov. 1948).

The young have fur of a maltese gray, with white underneath, when born, and gradually lose color as they grow older. At maturity the animals are smoky-white or even practically all white except for a sooty nose spot.

The eyes at first appear to be dark instead of pink like those of true albino animals. Closer examination under strong light, however, shows them to be a dark red, therefore somewhat like albino eyes except for the possible possession of a little pigment. Dr. Dozier suggests that genetically the

new color-phase may be an "albino allele," or partial albino.

True albino muskrats have also been found in this region, he reports, in addition to other color phases running the whole gamut between the albinos' pure white fur through fawn and the usual browns to a complete black.

Dr. Dozier is keeping muskrats of as many different colors as he can secure, both by his own efforts and the cooperation of interested trappers. He keeps them in breeding pens and is working out as well as he can the genetics of their coat colors for the benefit of the future fur trade.

Science News Letter, May 14, 1949

AERONAUTICS

England Stepping Ahead In Building Flying Boats

► ENGLAND is stepping ahead in the production of giant flying boats for overseas civilian transportation, it was revealed in London with the announcement of a new fleet under construction, the first ship of which will be ready for flight early in 1951. The new craft will belong to the Princess fleet.

Great Britain's decision to order and operate more flying boats at a time when the big airline operators of the world were giving them up in favor of landplanes, was a gesture of confidence in a type of airliner which has been extensively used by British companies almost since regular commercial air transport service began, the Society of British Aircraft Constructors recently stated.

The principal advantage of their use is the fact that the big flying boat needs few special facilities for its operation, and that every open stretch of water is a potential landing place. Flying boats do not need expensive landing fields, merely having to pay port charges and for such special services as may be provided for their special use.

Three of the new Princess double-deck flying-boats, which British Overseas Airways Corporation will operate across the Atlantic to South America, are under construction in the Cowes, Isle of Wight, workshops of Saunders-Roe Ltd. Parts for four more have been ordered. When completed, they will be 140-ton craft, each with ten engines.

Bristol Proteus turbo-prop engines will provide each Princess with power. Eight of them will be arranged in pairs, and two separate units will be placed in an extreme outer wing position. With a total of 35,000 horsepower, the Princess flying boats will be able to cruise at 380 miles an hour. They are designed for a still-air range of 5,500 miles. This is regarded as sufficient for flights from London to Buenos Aires, on which the maximum stage lengths are 3,100 miles, or for a trip from England to New Zealand, with maximum hops of 3,000 miles.

Science News Letter, May 14, 1949

MEDICINE

Streptomycin Royalties Build Research Institute

► STREPTOMYCIN, famous antibiotic drug which was almost literally dug out of the earth, will have its life-saving benefits greatly increased through the generosity of its discoverer, Dr. Selman A. Waksman of Rutgers University. Royalties from the streptomycin patent will be plowed back into more research of the kind that gave the world this drug and may give it others equally beneficial.

The drug was patented by Dr. Waksman in 1945, two years after he and his students discovered it, in order to insure its greatest development in the public interest.

Dr. Robert C. Clothier, president of Rutgers announced that Dr. Waksman has assigned his patent to the Rutgers Research and Endowment Foundation and that royalties from the patent will be used to build and operate a new Institute of Microbiology at Rutgers. Dr. Waksman will be its first director.

Science News Letter, May 14, 1949

GENERAL SCIENCE

Rate of Fabric Wear Is Determined Electrically

► THE probable life of fabrics at points of wear can now be determined electrically and accurately without injury to the goods. The rate of wear is determined by measuring the "electrical capacity" of the cloth in use at regular intervals. This property of the textile decreases with the wear.

Electrical capacity, called capacitance by scientists, is the property of materials which permits the storage of electricity when there are potential differences between conductors. In a new instrument developed for measuring wear in textiles, the wear is measured by sending electric impulses through the fabric. In the process, terminals of the electric source are far enough apart so that the sample of textile can be passed between.

This process of measuring textile wear was developed by Dr. H. F. Schiefer and associates at the National Bureau of Standards. The work was done under the sponsorship of the Army Quartermaster General whose special interest is more durable clothes for soldiers. The same device can be used for exploring the uniformity of textile materials.

This new process promises to have wide applications in replacing unsatisfactory and destructive methods now employed. One of these is by measurement of the time required to wear through a sample in an abrading machine. Other methods are based on changes in thickness with wear, air permeability, light transmission, and the breaking strength of material at various stages of abrasion.

Science News Letter, May 14, 1949

MEDICINE

May Stockpile Blood Cells

This possibility of preparedness against an atomic bomb attack comes with the discovery of a way to separate the elements of the blood from each other.

By JANE STAFFORD

► RED BLOOD cells from millions of pints of blood, stockpiled at strategic points throughout the nation, will be ready for use to save lives if an atomic bomb attack is launched on any American city.

Individual bottles of red cells, typed for each member of the family, will be kept in the deep freeze locker along with the family's meat, vegetable and strawberry pie reserves, ready for emergency transfusions.

Extracts of the blood chemical, thromboplastin, that starts the clotting process, will be available in sufficient supply for victims of some bleeding diseases.

These are the possibilities for the not too distant future, say five years or so from now. Conservative scientists are not publicly making such predictions. But the research they are reporting and the pilot plant studies now under way point to these goals.

All these possibilities, and maybe more, depend on the discovery of a way to separate the red blood cells, white blood cells and other formed elements of the blood from each other and from the liquid part of the blood quickly and gently. The quick and gentle features of the new method insure that the various kinds of blood cells come through the separation process intact and alive.

Red Cells Die in 21 Days

Red blood cells in blood, for example, die 21 days after the blood has been drawn from a donor's arm, even with the best of present preservatives. Even in the blood circulating in the body their life-span is limited to about four months. But if they can be separated from the white blood cells before these disintegrate, and before various enzyme chemicals in the blood can act, the red cells might live almost indefinitely. And red blood cells are as good as, and in about a third of the cases better than, whole blood for transfusion.

The way to separate them before they are damaged has been discovered by Dr. John G. Gibson, II, and associates of Harvard Medical School, following leads reported earlier by Drs. Allen H. Minor and Lee Burnett of New York and Dr. Seymour Gray of Chicago. The method consists in adding fibrinogen, a blood protein involved in the clotting process, to the blood as it is drawn from the donor's arm. This makes the red cells pile up face to face like a stack of coins and settle out together within an hour.

The fibrinogen used is one of the blood fractions obtained by methods developed by Dr. Edwin J. Cohn, also of Harvard, and his colleagues during the war. In Jacksonville, Fla., Dr. Cohn told members of the American Pharmaceutical Association about this newest application of fibrinogen.

Up in Boston, Dr. Charles P. Emerson at Massachusetts Memorial Hospitals is running pilot plant studies on collection of the blood and the new separation method. Results of his studies will be applied, perhaps within another six months, at Red Cross National Blood Program donor stations. The hope is that perhaps one-tenth of the blood now being collected will in future be drawn into special, silicone-coated bottles with special tubes and needles. The bottles will be turned upside down at once, and within an hour the separated red cells drawn from the bottom layer can be rushed to their storage place, while the white cells and plasma are rushed to processing centers.

One million pints a week for the first three weeks are needed to build our first line of medical defense against an atomic bomb attack.

Filling this huge prescription may become possible, now that a way has been found for large scale separation of red and white blood cells and blood platelets from each other and from the liquid part of the blood. As soon as the best methods of preserving these parts of blood have been worked out, enough can be stockpiled to take care of that million-pint-a-week prescription.

This prescription was written by medical authorities who studied the "Hiroshima incident." Of the 80,000 who died when the world's first atom bomb attack fell on that Japanese city, 20,000 could have been saved, it has been estimated, if adequate medical relief facilities had been available.

If an atom bomb dropped on an American city, there would be no trouble finding 3,000,000 Americans ready to donate their blood. But by the time enough doctors, nurses and technicians could be mustered to draw the blood and to test, type and process it for transportation, it might arrive at the scene too late. And since whole blood can be stored for only about three weeks, it is questionable whether enough could be stockpiled for such a disaster, even with thousands of men and women now giving blood generously to the Red Cross National Blood Program.

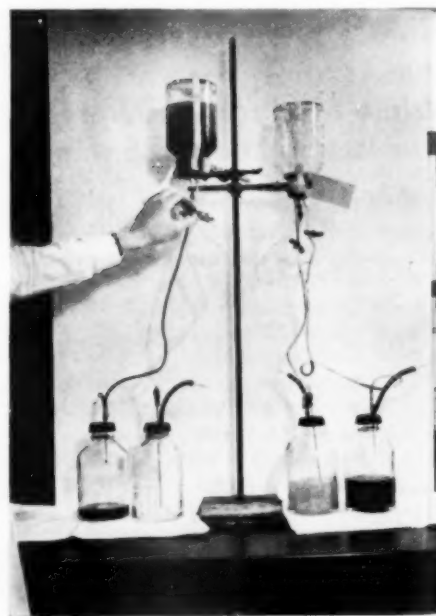
Whole blood has been called the number

one medicine for saving lives of atomic bomb victims. Blood, however, is a compromise. So long as white cells, red cells and other elements of blood all have to live together in one fluid that can circulate throughout the body, each of these elements must put up with conditions suited to all, just as members of a family may have to sacrifice individual comfort or convenience to get quarters that somehow work out best for the whole family.

Changing the Environment

Red blood cells, which transport oxygen throughout the body, might for example be much happier with a different degree of acidity in their environment, and might live much longer without some of the enzymes and other chemicals that surround them.

The red cells of the blood with their stores of oxygen are the part of blood needed by anemia victims. Atomic bomb victims get a special kind of anemia, in which they lack both red and white cells and hemoglobin. But for some kinds of anemia, perhaps also that which occurred in atomic bomb victims, the fluid part of the blood is not needed. Now that the cells can be separated from each other and from the fluid part of blood, there is hope that just



BLOOD SEPARATION—This shows the new blood separation method. The upturned bottles contain donors' blood to which fibrinogen has been added. Red cells, piled up on the bottom, are drained off first, leaving the clear plasma on top.

the parts needed by atomic bomb victims or other patients could be given.

The tiny elements in blood called platelets might be particularly valuable for atomic bomb victims and for some other patients with bleeding tendencies. The bleeding tendency following irradiation, by atomic bomb or otherwise, is now thought due to lack of platelets. These elements contain thromboplastin, the chemical which when released from the platelets starts the chemical process by which blood clots when shed. The clot is what stops bleeding.

Platelets are very short-lived. They die within one or two days at most, maybe within a matter of hours. They make up a very tiny part of blood, about one-tenth of one per cent of the volume of whole blood. It would be mechanically impossible to give enough blood by transfusion to make up for the platelet lack in severe states of deficiency. There is great promise now that scientists will be able to get in pure form the thromboplastin from platelets separated from donor blood by the new method.

A blood medicine for this, another blood extract for that, a third blood substance for still another disease condition may be the kind of prescriptions your doctor will be writing some day in the future.

To some extent he is already doing that. He is giving gamma globulin, a substance from blood, to ward off or lessen the severity of measles. In the operating room, the surgeon is using fibrinogen and thrombin from blood to stop oozing of blood from tiny blood vessels cut by his knife.

Blood in its entirety, whole blood, is ordered for transfusion to save a life threatened by loss of blood, and to help patients with some kinds of anemia.

But blood contains many substances besides the hemoglobin in its red cells that

give it color and carry oxygen, and the measles-fighting globulin and the clotting substances, fibrinogen and thrombin. It contains hormones from the various glands of the body, and white cells which are concerned with fighting disease germs.

These and many other substances in blood are not there just by accident.

"Every part of the human blood performs an important natural function," in the opinion of Dr. Cohn. He qualifies this statement by calling it an assumption only so far. But he and his colleagues and other scientists inspired by him are hard at work to discover, separate and study each of the many parts of human blood with the object of making as many of them available for medical use as possible.

Another new development gives promise that blood and its various parts will be available for many more uses in the future. This is an entirely new method of fractionating the plasma part of the blood. It was the plasma fractionation method developed by Dr. Cohn which gave us the albumin for fighting shock in the wounded during World War II, fibrinogen and thrombin and the anti-measles globulin. The new method, Dr. Cohn says, should make available some of the less stable components of the blood plasma which were destroyed in the earlier process.

Some of these less stable components may prove medically useful in themselves, or may help in preserving the red cells, white cells and platelets that now can be separated.

The final details of the red cell storage and preservation have not yet been worked out. Pushing the studies on this phase of the work is Dr. Robert B. Pennell of Sharpe and Dohme, now on loan to the Red Cross for this research.

Science News Letter, May 14, 1949

Sixteen authors, selected on the basis of their knowledge of their subjects and their ability to explain them to the general reader, are writing 22 chapters on "The Meaning of Mathematics", ranging from beginning algebra through graduate courses.

These articles began running in the Mathematics Magazine of March-April 1948. This magazine is published bi-monthly, except July-August. Its editorial policy is to make mathematics understandable. Some call the above chapters "Understandable Chapters in Mathematics". Subscription price is \$3.00. The present volume plus the March-April and May-June issues of the previous volume can be had for \$4.20, as long as the back issues last.

Address: MATHEMATICS MAGAZINE, Department c
405 Hilgard Avenue
Los Angeles 24, California

*A land that has known
glory and despair —
but never disgrace*



PARAGUAY:

*An Informal History
by Harris Gaylord
Warren*

A COMPREHENSIVE, one-volume survey of four bloody centuries in the "Little Giant" of South America. Here are the social, political, and economic factors that have entered into Paraguay's development—from its discovery and the Spanish conquest to the violent present. With accuracy and simplicity, the book presents a vivid picture of a strange land: the ancient plants and animals, fantastic creations of a capricious nature; the Guarani, fierce in war and cruel to their enemies; the battles, revolutions and wars that molded the land of today. Here, too, are the many personalities vitally linked with Paraguay's story: Charles Ames Washburn, United States minister during the War of the Triple Alliance; the peaceful and honest Ayala; Morinigo who aided Axis spies.

An important book for archaeologists, sociologists, historians — everyone who wants a better understanding of a country at the diplomatic crossroads of South America, a country whose future is still uncertain—but whose present again breathes revolution.

Illustrated, maps, \$5.00

ECUADOR AND THE GALÁPAGOS ISLANDS

*by Victor Wolfgang Von Hagen,
author of MAYA EXPLORER*

AN informal book that gives a fascinating insight into an unknown, mysterious and "schizophrenic" land — from the great heroes of the past to the people of modern Ecuador.

Illustrated, \$3.75

At all bookstores



UNIVERSITY OF OKLAHOMA PRESS
NORMAN, OKLAHOMA

WILDLIFE

Two Dead Elk Discovered
In Yellowstone Paint Pot

➤ DEATH in the Paint Pot might be an appropriate title for Yellowstone National Park's newest tragic mystery. There is no murder involved, however; only accident, so no hunt for a culprit will take place.

Park Naturalist David Condon, making an early spring patrol amid snowbanks that still lie thick on the Park plateau,

found the carcasses of two elk in one of the great paint-pots, or kettle-like craters in which masses of almost impalpably fine rock-flour constantly steam and bubble like porridge. They had evidently fallen in some time during the winter, and had been almost instantly killed by heat and suffocation.

Hot springs and steam vents have been known to claim small mammals and birds as victims, but this is believed to be the first case in which animals as large as elk have been involved.

Science News Letter, May 14, 1949

Seniors of 1950

➤ WITH summer vacation ahead, many high school students will start work on scientific projects which will be part of their entry in the Ninth Annual Science Talent Search.

Choice of a project may puzzle many with the whole field of science to choose from. The titles of project-essays written by some of the 40 winners in the Eighth Annual Science Talent Search may offer helpful suggestions:

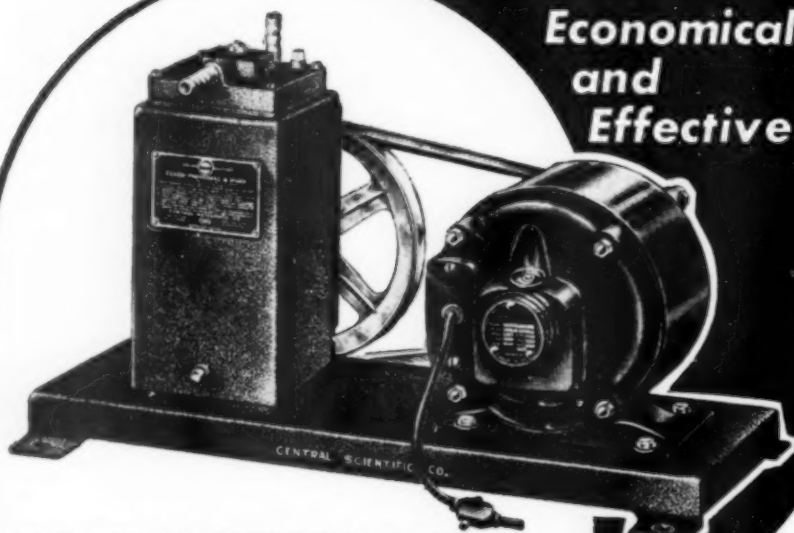
Acclimatization of a Marine Ciliate to Media of Varying Salt Concentrations; Determining Growth of Yeasts in Liquid Media by Microscopy and Turbidimetry; Speleology: The Study of Caves, Cave Animals and Plants; Geometrical Properties of Equations in Different Systems of Coordinates; Three, Four, and Higher Dimensional Determinants; Basket Maker III Ancient Pre-Pueblo Life in the American Southwest; Measurement of Magnetic Retention of Soft Iron under Different Temperatures; Comparison of the Relative Time Required to Peptize Sulfide Precipitates; Photoelectric Generator to Produce Wave Forms and Pictures on Oscilloscopes; Year-round Study of Birds Living Near a Small Pond; Controlled Precipitation of a Metal: Silvering Glass; Photographic Observation of Solar Phenomena with Original, Homemade Equipment; Mathematical Reflections Through Various Curves; A Homemade Working Model of a Wimshurst Electrostatic Generator; Growth Without Soil as a Tool for Research; Micro-projection of Prepared and Living Material; A Comparison of the Continuous-Film-Staining Technique with the Hand Method; The Integrator and a Series of Graphs to Illustrate Its Action; Electronic Checking of the Accuracy of Watch Movements; Influence of Deliquescent and Efflorescent Compounds on Evaporation of Water; Three Color Separation Camera and Photographic Process; The Effects of Dicumarol on the Prothrombin Level of the Blood; Electrophoresis Equipment for Determining Protein Constituents; Homemade Apparatus for Analyzing Motions of Rotating or Vibrating Objects; Testing Linearity of Sound-on-light Transmission; Geographic and Ecologic Distribution of Land and Fresh Water Mollusks.

Science News Letter, May 14, 1949

for
PRESSURE

or
VACUUM

Economical
and
Effective



THE CENCO-PRESSOVAC PUMP

is ideal for backing up liquid or mercury diffusion pumps in low pressure systems. May be used to circulate or collect gases . . . or to conduct fumes from distillations to vents. It has large free air displacement . . . 34 liters per minute. Guaranteed to attain 25 microns pressure. When compressed air is required, this pump will satisfy the need . . . 10 lbs. per square inch maximum. Designed for trouble-free operation and long service.

Price, each-----\$75.00

No. 90510A Cenco-Pressovac Pump for 115 volts, 60 cycles, A.C.

Models are available for other voltages, frequencies, and direct current.



Write Dept. B. G. for
Engineering Bulletin 10.

CENTRAL SCIENTIFIC COMPANY

Scientific Apparatus • Instruments • Chemicals

1700 IRVING PARK ROAD, CHICAGO 11

NEW YORK BOSTON SAN FRANCISCO NEWARK LOS ANGELES TORONTO MONTREAL

45 x 3.5 POWER BINOCULAR

With **COATED LENSES**
and **INTERPUPILLARY ADJUSTMENT**



Sensation of the Year! Many features of high priced binoculars. Heavy duty, all-purpose; precision. Carry- Money back guarantee. ing case, shoulder straps. **SEND NO MONEY**, pay postman, plus charges. Send remittance with order, we send prepaid. Ideal gift. Money back guarantee.

GOERTZ COMPANY, Dept. G-18
1148 West Chicago Ave. Chicago 22, Illinois

SENIORS OF 1950

Start Now on YOUR SCIENTIFIC PROJECT
TO WIN in the *Ninth* ANNUAL

Science Talent Search

Conducted by SCIENCE CLUBS OF AMERICA, a SCIENCE SERVICE activity and sponsored by the WESTINGHOUSE EDUCATIONAL FOUNDATION, an organization endowed by the WESTINGHOUSE ELECTRIC CORPORATION for the purpose of promoting education and science.

You have a chance to share in
FOURTEEN THOUSAND DOLLARS
in WESTINGHOUSE SCIENCE
SCHOLARSHIPS AND
TRIPS TO WASHINGTON

Start your project NOW

- 1 Pick a subject that you can investigate at first-hand, preferably one about which you can do more than just read. Typical projects of Science Talent Search winners have been in such fields as Aeronautics, Agriculture, Astronomy, Botany, Chemistry, Electronics, Geology, Mathematics, Meteorology, Medical Sciences, Nutrition, Photography, Physics, Psychology, Radio, and Zoology.
- 2 Whatever your project may be—read about it. Learn what has already been done. It is often desirable to repeat previous experiments, but it should be done deliberately and for a purpose.
- 3 Write what you did, not merely what you read. Tell it in simple language; follow it through step by step. Then tell what you observed as a result of your experiments, and what conclusions you draw from these observations.
- 4 Fancy writing has no place in science. There has been great writing in the sciences but it is the greatness of strength and simplicity.

WRITE AN ESSAY of about 1,000 words on the subject, "MY SCIENTIFIC PROJECT." Your essay should tell what you are doing or plan to do in science in the way of experimentation or other research activity. It should be original and creative in character. Now, before the school year ends, is the time for high school seniors of 1950 to get started on science projects. With an early start you can plan a project, carry it through more carefully, write a better essay on it. Next December take an examination which tests your ability rather than your fund of information. Supply your school with information about yourself to be sent in with your essay and examination papers.

Do these three things and you may be among the forty boys and girls who will win all-expense trips to the Science Talent Institute and compete for scholarships for the continuation of your education. Of the forty, one will be selected as winner of the \$2,800 WESTINGHOUSE GRAND SCIENCE SCHOLARSHIP; another as winner of the \$2,000 WESTINGHOUSE GRAND SCIENCE SCHOLARSHIP; eight more of the forty boys and girls will be selected to receive WESTINGHOUSE SCHOLARSHIPS of \$400 each; and \$3,000 more in WESTINGHOUSE SCHOLARSHIPS will be awarded at the discretion of the judges. Every one of the forty boys and girls will, when in Washington, be awarded the GOLD EMBLEM OF SCIENCE CLUBS OF AMERICA.

SEE YOUR SCIENCE TEACHER

or write SCIENCE CLUBS OF AMERICA, 1719 N Street, N. W., Washington 6, D. C.



Toadstool Is Mushroom

► BRIGHT flowers and uncurling fern leaves are not the only spring offerings of woods and fields. A lower order of plants, the fleshy fungi, puts in its sudden and puckyish appearances, popping up from the damp leaf-mold and out of the moist sod after every night of rain. They challenge us to gather and cook and eat, and at the

same time warn of toxic tummy-aches, if not worse.

How to tell the good from the bad, in this group of plants, is a practical and perennial spring problem. Every person with any local reputation for a knowledge of nature lore is certain to be asked, many times, "How can I tell mushrooms from toadstools?"

The answer is easy. If it has a more or less round cap and a supporting stalk it is a mushroom. It is also a toadstool. The words are synonyms; either designates a fungus of that description.

Such an answer, however, is bound to leave the questioner unsatisfied. To him, "mushroom" means a fleshy fungus that is good to eat; "toadstool" one that is poisonous. Learning that he has been under a misapprehension regarding the actual meaning of the words only adds to his confusion, and certainly does not solve his problem. What he wants to know is: Can I, or can't I, safely eat this thing?

Unfortunately, there is no safe rule-of-thumb for distinguishing between edible and poisonous mushrooms—or toadstools. Poisonous species do not turn silver spoons black. Whether the skin of the cap peels off easily or not is no criterion. Nor is a black underside of the cap a sign of danger; indeed, the common mushroom offered for sale on the market is black underneath, and the deadliest of all mushrooms, the amanitas, are innocently white! You just have to learn your mushrooms, species by species—or get acquainted with a competent botanist.

It is easy, however, to identify the amanitas, which are at once the commonest and most dangerous of all the poisonous mushrooms. If the stalk arises out of a cup at the base, and is encircled with a loose ring of fungus tissue, then it is an amanita, and should be shunned. Some other mushrooms have cup only, or ring only; amanitas have both.

Science News Letter, May 14, 1949

• Books of the Week •

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W. Washington 6, D. C. Ask for free publications direct from issuing organizations.

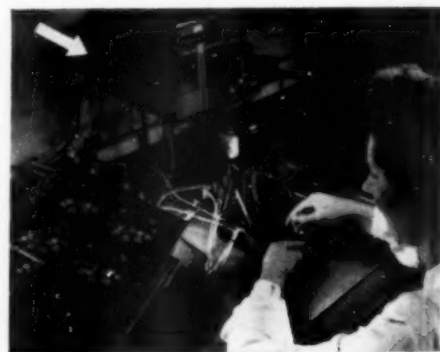
AMERICAN FOUNDATIONS AND THEIR FIELDS—Wilmer Shields, Rich and Neva R. Deardorff, Eds.—Raymond Rich Associates, 6th ed. 284 p., \$6.00. Revision of this standard reference book giving purposes, methods of operation, direct activities and financial data, of American foundations.

THE A. R. R. L. ANTENNA BOOK—*The American Radio Relay League*, 5th ed. 288 p., illus., paper, \$1.00. Latest information on principles of antennas and transmission lines and specific designs for the various amateur bands.

BIOCHEMICAL EVOLUTION — Marcel Florkin, edited, translated and augmented by Sergius Morgulis—Academic Press, 157 p., illus., \$4.00. Intended to show that evolution and the classification of animals can be considered from a biochemical viewpoint.

CAUSES OF INDUSTRIAL PEACE UNDER COLLECTIVE BARGAINING: Case Studies 5 Sharon Steel Corporation—United Steelworkers of Amer-

ica—J. Wade Miller, Jr.—National Planning Association, 59 p., paper, \$1.00. Telling what made for peace.



"E" Galvanometer Saves Space And Time In Lab

Calibrating reference junction coils is one of the many ways in which we use the Type E Galvanometer in our own plant. Formerly requiring a wall-type galvanometer, this routine operation is now carried out more conveniently, in less space, with the Type E.

Compact and self-contained, Type E is the "just right" answer—in sensitivity and speed—for a variety of null measurements.

Catalog ED Sec. 1 sent on request.



Jr1 Ad ED 22(6c)

LINGUAPHONE



is your *Passport*
to the World

In your own home, alone or in a group, you can now learn to speak

SPANISH • PORTUGUESE
FRENCH • RUSSIAN
ITALIAN • GERMAN

or any of 23 other languages by the world-famous

LINGUAPHONE Conversational METHOD

You learn the new language by listening to voices of native teachers. It is amazingly simple; thousands have succeeded. Educators hail Linguaphone as a notable advance in simplifying the mastery of languages. That is why so many Linguaphone Sets are used in schools, colleges, universities, as an aid to fluent speaking.

Available to Veterans under
G I BILL OF RIGHTS

SEND FOR FREE BOOK
LINGUAPHONE INSTITUTE
31 RCA BUILDING, NEW YORK 20, N.Y.

LINGUAPHONE INSTITUTE
31 RCA Bldg., New York 20, N.Y.
Send me the FREE Linguaphone Book.
I am ☐, am not ☐ a World War II Veteran
I want to learn.....language.
Name
Address..... City.....

HOUSES OF EARTH

The ground you stand on is your best building material. Easy to build—insulated against heat and cold. Ratproof—Soundproof—Termiteproof and Fireproof. Book based largely on findings of the Bureau of Plant Industry, Soils and Agricultural Engineering. Low Building and Upkeep costs.

"HOUSES OF EARTH"

42-page booklet containing complete building instruction and 18 illustrations. Mailed upon receipt of \$1.00. Add postage foreign orders.

A. B. LEE

Box 171-Ben Franklin Station
Washington, D. C.

COMMUNICATIONS RESEARCH 1948-1949—Paul H. Lazarsfeld and Frank N. Stanton, Eds.—Harper, 332 p., \$4.50. Studies by Columbia University's Bureau of Applied Social Research on what children think about the comics, what listeners want to hear on the radio and what newspaper readers like about their favorite daily, and including an analysis of domestic broadcasting in the USSR.

THE CORN PLANT OF TODAY—Edgar Anderson—Pioneer Hi-Bred Corn Company, 20 p., illus., paper, free upon request to publisher, Des Moines 9, Iowa. Facts about corn basic to an understanding of how to raise better crops.

ELEMENTS OF AERODYNAMICS OF SUPERSONIC FLOWS—Antonio Ferri—Macmillan, 434 p., illus., \$10.00. For aeronautical engineers and those working on high-speed projectiles.

ELEMENTS OF APPLIED HYDROLOGY—Don Johnstone and William P. Cross—Ronald, 276 p., illus., \$5.00. An undergraduate text.

EVALUATION OF CHEMOTHERAPEUTIC AGENTS—Colin M. MacLeod, Ed.—Columbia University Press, 205 p., illus., \$4.00. Papers of a symposium of the recently established section on Microbiology of the New York Academy of Medicine.

FLIGHT INTO HISTORY: The Wright Brothers and the Air Age—Elsbeth E. Freudenthal—University of Oklahoma Press, 268 p., illus., \$3.75. The story of the race between men for the honor of being the first to fly.

HANDBOOK OF FLUORESCENT GEMS AND MINERALS—Jack DeMent—Mineralogist Publishing Company, 68 p., paper, \$1.50. A practical guide for the gem and mineral collector.

MEET THE PLASTICS—Clark N. Robinson—Macmillan, 172 p., illus., \$3.75. Explanation for the layman of the basic chemistry of plastics, the ingredients and special characteristics of each, and its uses and processing methods.

THE NEW INTERNATIONAL 1949 YEAR BOOK: Events of 1948—Henry E. Vizetelly, Ed.—Funk & Wagnalls, 688 p., illus., \$10.00. Review of the year's outstanding events.

PLANNING THE UNIVERSITY LIBRARY BUILDING—John E. Burchard, Charles W. David, and Julian P. Boyd, Eds.—Princeton University Press, 145 p., illus., \$2.50. Recommendations of a Cooperative Committee on Library Planning financed by the Rockefeller Foundation.

REPORT OF THE COMMITTEE ON A TREATISE ON MARINE ECOLOGY AND PALEOECOLOGY—Harry S. Ladd, Chairman—National Research Council, 117 p., paper, \$1.00. A highly specialized report by the Division of Geology and Geography Committee of the National Research Council. Includes research reports.

THE SALICYLATES: A Critical Bibliographic Review—Martin Gross and Leon A. Greenberg—Hillhouse Press, 380 p., illus., \$6.00. A review of over 4,000 titles on these widely used medicines.

SEQUENCE IN LAYERED ROCKS—Robert R. Shrock—McGraw-Hill, 507 p., illus., \$7.50. A study of features and structures useful for determining top and bottom or order of succession in bedded and tabular rock bodies.

THE SHOW OF VIOLENCE—Frederic Wertham—Doubleday, 279 p., \$3.00. An analysis of the inadequacy of our laws to deal with murder and its problems.

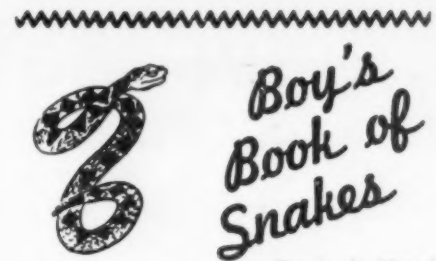
TEMPERATURE AND HUMAN LIFE—C. E. A. Winslow and L. P. Herrington—Princeton University Press, 272 p., illus., \$3.50. This book analyzes how heat and humidity affect human life and what artificial controls are most effective.

UNRESTING CELLS—R. W. Gerard—Harper, 439 p., illus., \$4.00. Introducing the layman to new adventures in the land under the microscope. Striking illustrations.

Science News Letter, May 14, 1949

Don't Delay

getting that NEW BOOK you want to read. SCIENCE NEWS LETTER will gladly obtain for you any American book or magazine in print. Send check or money order covering regular retail price (\$5 if price is unknown and adjustment will be made). We will pay postage in the United States. You can attach a separate sheet, listing title, author, publisher, price, to your address coupon on the back cover and mail to Book Department, Science Service, 1719 N Street N. W., Washington 6, D. C.



Percy A. Morris

This new book disposes once and for all of those wild yarns you hear about snakes, giving you instead the true and far more interesting facts about their habits, haunts, and characteristics.

"A most interesting book . . . filled with invaluable information in text and pictures."—Saturday Review of Literature

"Has any number of photographs of American snakes and those of foreign parts, and any amount of information such as men or boys can use in the field to recognize and understand serpents."—N. Y. Herald-Tribune \$3.00

EXPLORING ELECTRICITY

Hugh H. Skilling

The complete story of electricity, revealing little-known and fascinating facts about the men who contributed to its advance.

"Takes on a live, vital quality in telling the stories of the men who make up electricity's family tree. Not only is this a book which anyone who has any interest whatsoever in electricity should read, it is a book that should be collateral reading for all whose studies take them into that field."—The Scientific Monthly. Illustrated. \$3.50

SUNSPOTS IN ACTION

Harlan True Stetson

The strange, wonderful, highly readable account of how sunspots, those periodic explosions on the sun's surface, affect radio, television, the weather, plant and animal life, and even the business cycle. Told by a scientist of international reputation. "A stimulating, pleasurable experience."—N. Y. Herald-Tribune. Illustrated. \$3.50

ROCKS AND RIVERS OF AMERICA

Ellis W. Shuler

Here's a book that strips the technical jargon from geology to give you the full scope, cultural interest, romance and wonder of the science. Richly illustrated with photographs from every state, it tells the story of the soil, caves, sinkholes, lakes, canyons and mountains of America. 105 illus. \$4.00

PLANT GROWTH

L. Edwin Yocum

A workbook on how to grow plants and experiment for improvement successfully. Gets down to essentials of soil, water, temperature and air, and their influence on plant growth. Includes diseases, weeding, hybridizing, hormones, and plant culture theories. Illustrated. \$3.00

Write Dept. 30 for free folder describing full list of science books.

THE RONALD PRESS COMPANY
15 East 26th St., New York 10

to smooth the way for DIABETICS



"Diabetic Care in Pictures" was designed to smooth the way so that diabetes and its treatment might be completely understood. The result of more than 25 years of questioning in a nationally-known clinic—and the tested answer to all those questions. Simply written and lavishly illustrated by charts, photographs and drawings, it tells about the diet, measurement and injection of insulin, insulin reactions, acidosis and diabetic coma, blood and urine tests and necessary body care. The coupon below will bring a copy immediately.

DIABETIC CARE IN PICTURES

by
Helen Rosenthal, B.S.,
Frances Stern,
M.A., and
Joseph Rosenthal, M.D.

\$2.50

150 PAGES—137 ORIGINAL ILLUSTRATIONS

J. B. LIPPINCOTT COMPANY
East Washington Square, Philadelphia 5, Pa.

I enclose \$2.50. Please send me "Diabetic Care in Pictures."

NAME.....

STREET.....

CITY, ZONE, STATE.....

SNL (10 day return privilege guarantee)

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 465. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **HOUSEHOLD BROOM**, with plastic bristles instead of the conventional straw, holds its shape, gets into corners, traps dirt instead of scattering it, and picks up lint from rugs. It is washable, does not lose its bristles, and will outlast four ordinary straw brooms, it is claimed.

Science News Letter, May 14, 1949

❁ **HEATER-SPEAKER** brings both the words and music from the film and heating comfort to persons in a parked car at a drive-in motion picture theater. The combination device is hung on the inside of a car window, its heating element being able to provide comfort even in relatively cold weather.

Science News Letter, May 14, 1949

❁ **COIN DEVICE**, for use in stores, holds the coins dropped into it suspended in mid-air in a spread-out position between two glass plates until they disappear into the cash vault. It makes easy counting of the coin cash possible.

Science News Letter, May 14, 1949

❁ **COMBINATION ELECTRIC** clock-refrigerator defroster, shown in the picture,



when properly set will turn the refrigerator off at 1 o'clock in the morning and on again after the thin skin of frost is removed from the unit. This precision timing instrument can be used with any electric refrigerator, old or new.

Science News Letter, May 14, 1949

❁ **CORD HOLDER**, for use with an electric flatiron and designed to keep the cord out of the way of the ironer, is a flexible steel rod that is attachable upright to the end of the ironing board to the top of which the cord is fixed. The rod bends easily following the movements of the iron.

Science News Letter, May 14, 1949

❁ **PAPER PILLOWS**, developed in England and now used on railway trains and in hospitals, have outer covers of highly bleached cellulosic paper, and fillings of shredded paper. Packed in a sealed cellophane wrapper, they are sold to night coach passengers for about 20 cents.

Science News Letter, May 14, 1949

❁ **PLASTIC COVERINGS**, to hold photographs, menus, price lists and other similar articles are made to fit the customer's individual requirements, and may be had in any sizes. The transparent plastic front and rear are sealed together with an edge-weld that eliminates cement, stitching or tape.

Science News Letter, May 14, 1949

Do You Know?

Durum is the kind of wheat best adapted for macaroni making.

Macaroni products are not baked by manufacturers but are dried under carefully controlled conditions.

During the grazing season a cow on pasturage eats the equivalent of about two tons of dried forage.

Radar is now used on more than 700 vessels on the sea, the Great Lakes and the Mississippi River to avoid delays due to fog or darkness.

The yellow color of the fat of cattle fed on grass is due to carotene, hence this yellow fat is a better source of vitamin A than the more commonly flavored white fat.

A car that gets 21 miles per gallon of gasoline at a speed of from 20 to 40 miles an hour generally gets but 16 miles at 60 miles per hour and nine miles at 80 miles an hour.

3 EXPERIMENTAL KITS

COLOR • MAGNETIC • SILK

ALL FOR \$1

- **COLOR**—A spinning top helps you to explore the world of colors—what it is and how colors affect each other. 50c
- **MAGNETIC**—Contains specimens which demonstrate some of the most recent developments in magnetism, including the magnetic fluid clutch. 50c
- **SILK**—Specimens and experiments show the production of one of the world's oldest and loveliest fabrics. 50c

As an SNL subscriber, you are eligible to receive ALL THREE KITS for \$1.00

I enclose \$1 for which please send me the Color, Magnetic, and Silk kits. My address is imprinted at the right.

SNL PRIORITY ORDER

SCIENCE SERVICE
1719 N Street N.W. • Washington 6, D. C.

Clip and enclose this address imprint whenever you write us to renew your SCIENCE NEWS LETTER subscription, change address, order materials, etc. It identifies you as one of the SNL family. Lower line date is expiration. Allow three weeks for address change.

DETROIT PUBLICATION
TECHNOLOGY DEPT
96 PUTNAM AVE
DETROIT 2 MICH
MAY 14 1949